

# Differential Diagnosis of a Tender Goiter

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Subacute thyroiditis is generally felt to have a viral etiology, and the diagnosis is usually obvious when the patient presents with a diffusely enlarged and very tender thyroid gland associated with elevated free T<sub>4</sub> levels, elevated sedimentation rate, low radioiodine uptake and/or nonvisualization on scan and often some systemic symptoms. Subacute thyroiditis can be unilateral or focal (1,2). Corticosteroids are very effective in relieving symptoms of subacute thyroiditis, often within 24 hr (3). Three patients are presented where the initial impression was subacute thyroiditis, there was a clinical response to prednisone, but none of the patients actually had subacute thyroiditis.

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## CASE REPORTS

### Case 1: Hodgkin's Disease

A 19-yr-old man presented with about a 10-day history of marked neck pain and swelling. Two days previously, he had been started on 60 mg of prednisone at a university health service with definite improvement in the pain, and he felt his neck swelling was smaller.

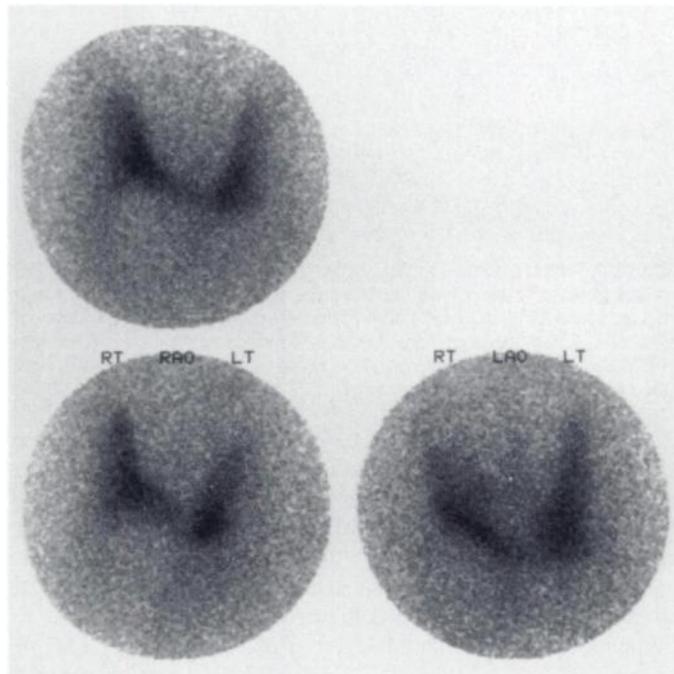
On examination there was a 4.0-cm mass in the region of the lower right lobe and isthmus, which was firm and tender. A [<sup>99m</sup>Tc]pertechnetate scan showed this mass was hypofunctional. There was the faint suggestion of a rim of activity around the mass (Fig. 1). Thyroid function studies included a free T<sub>4</sub>I of 2.3 (normal range 1.7-4.8) and a TSH of 0.61 mU/liter. The erythrocyte sedimentation rate (ESR) was 32 and WBC 14,800 with 84% PMN's.

Fine-needle biopsy aspiration was attempted with 22- and 25-gauge needles. The procedure was painful and only a scanty, inadequate amount of material was obtained on two passes. A tentative diagnosis of localized subacute thyroiditis was made. The patient was instructed to taper the prednisone and return in a month. He called 10 days later, virtually pain free and had resumed his usual routine at school.

One month later, the patient returned feeling well. Thyroid function tests were normal, including a TSH of 0.7. The mass was felt to be 3.0 cm in size, hard but not at all tender. On repeat fine-needle biopsy, good cellular samples were obtained and were diagnostic of Hodgkin's disease (Fig. 2). CT images showed a 7 cm × 5-cm superior mediastinal mass which likely extended into the region of the right thyroid lobe (Fig. 3). The radiologist was unable to completely exclude the possibility that this was a separate thyroid mass.

### Case 2: Neck Abscess

A 49-yr-old man presented with a history of very severe pain in the anterior lower neck area intermittently for a month. He denied any fever or weight loss. A recent thyroid scan showed no visualization of the left lobe and only minimal uptake of the [<sup>99m</sup>Tc]pertechnetate tracer in the lower right lobe (Fig. 4). The 6-hr low radioiodine uptake was 0.8%.



**FIGURE 1.** Technetium-99m-pertechnetate scan shows a large hypofunctional mass that seems to arise off the lower right lobe and isthmus. Note the faint suggestion of a rim of activity surrounding the mass. The top image is an anterior projection. The bottom images are right anterior oblique (RAO) and left anterior oblique (LAO) projections.

On examination, the thyroid gland was considerably enlarged to about 45 g (normal 15 g) with the left lobe much larger than the right. The gland overall was very firm and tender. Thyroid function studies showed a mildly elevated FT<sub>4</sub>I of 6.7 (normal 2.2-6.0) and a suppressed TSH of 0.1 mU/liter. The ESR was 50.

A diagnosis of subacute thyroiditis was made and he was started on prednisone 40 mg tid for 5 days and then 40 mg bid. He returned 10 days after his initial visit with marked clinical improvement. There was much less pain, the gland was slightly smaller being less than 40 g and much less tender on palpation. The prednisone dosage was continued at 80 mg a day.

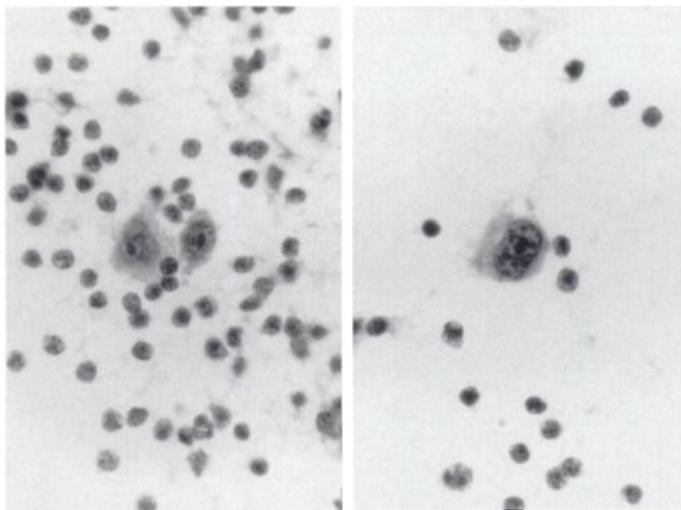
Ten days later, he returned complaining of worsening of his neck pain. The thyroid gland was definitely larger, being about 60 g, the left side again was significantly larger than the right. Needle biopsy was performed and about 10 cc of foul smelling, purulent material was removed. It was clear that the lesion was incompletely evacuated. He was hospitalized the same day requiring an emergency tracheostomy. Subsequently, a copious amount of pus was drained from a large abscess which arose from an extension of a laryngeal carcinoma.

### Case 3: Metastatic Lung Carcinoma

A 54-yr-old man presented with the history of noticing a painful goiter associated with dyspnea and dysphagia for about 5 wk. He was placed on prednisone for 10 days with improvement in the pain. When the prednisone was stopped, the pain recurred and prednisone was re-instituted at a dose of 60 mg daily for 1 wk.

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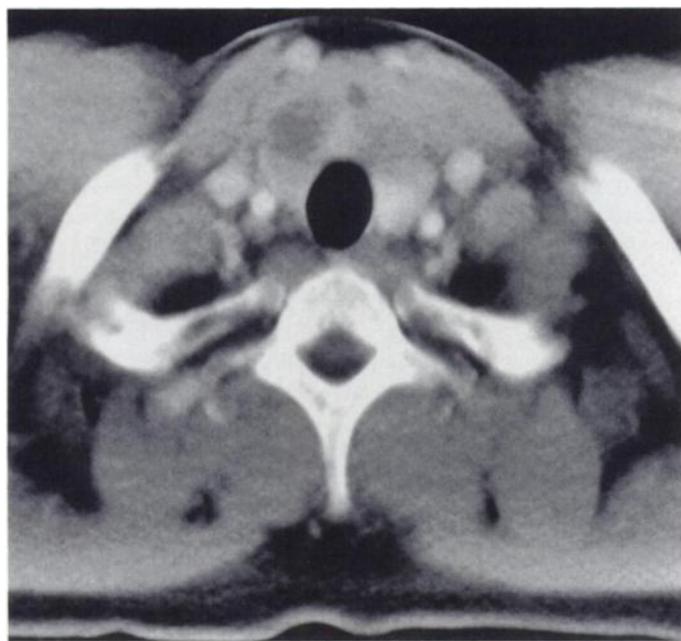
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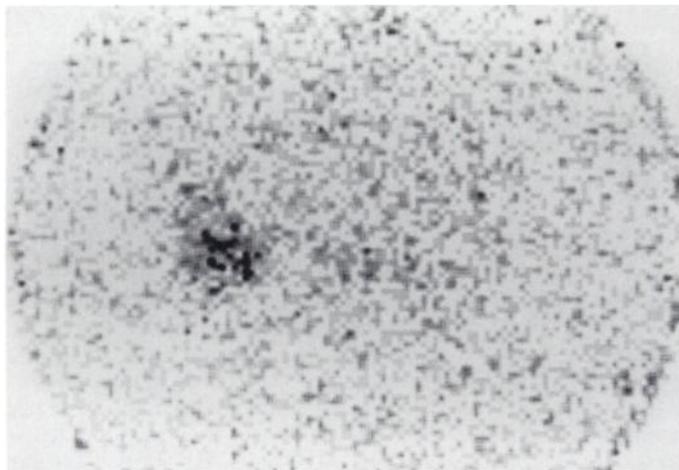
**FIGURE 2.** Histologic findings. The cellular background is lymphocytic and includes immature, as well as mature cells. Scattered among the lymphocytes are many multinucleated cells with large vesicular nuclei and prominent red nucleoli. There are occasional binucleated identical cells consistent with Reed-Sternberg cells. There is no thyroid material evident. The close-up view (right) shows a typical Reed-Sternberg cell.

When we first saw the patient, he no longer complained of neck pain. On examination, his thyroid was diffusely enlarged with the right lobe being about four times normal size and the left twice normal size. The gland was markedly tender. The thyroid scan showed a patchy uptake of the [ $^{99m}\text{Tc}$ ]pertechnetate tracer throughout. A diagnosis of resolving subacute thyroiditis was entertained and the prednisone dosage was reduced to 45 mg daily.

When his laboratory data became available showing a TSH of 5.5 and a FT<sub>4</sub>I of 3.7 (normal 2.2–6.0), the diagnosis of subacute thyroiditis was immediately questioned and fine-needle biopsy aspiration was performed on the right lobe. The cytopathologic diagnosis was that of a Hurthle cell carcinoma. He was subsequently found to have a high-grade, bronchogenic carcinoma and, after reviewing this material, the cytopathologist concluded the



**FIGURE 3.** CT images demonstrate a fairly large heterogeneous superior mediastinal mass about 7 cm × 5 cm which extends superiorly into the region of the right thyroid lobe. In the region of this right thyroid lobe, there is a 2.0 × 1.2-cm area, and a separate low-density thyroid mass could not be completely excluded.



**FIGURE 4.** Minimal uptake of the [ $^{99m}\text{Tc}$ ]pertechnetate tracer in the lower right lobe. There is no uptake in the left lobe which contains the abscess.

thyroid lesion represented large-cell metastatic adenocarcinoma of pulmonary origin.

## DISCUSSION

Patients with viral subacute thyroiditis experience neck pain and thyroid tenderness. The pain may involve the whole gland, one lobe or part of one lobe. If the pain is not initially bilateral, it will usually spread to the other side in days to weeks. There are usually some systemic symptoms present. On examination, the thyroid is typically extremely tender and mildly to moderately enlarged. Usually the enlargement is diffuse but it may be unilateral or nodular and is firm to hard in consistency.

The inflammation results in the discharge of thyroid hormone into the circulation resulting in high T<sub>4</sub> and T<sub>3</sub> levels in the serum and a low TSH. The damage to the follicular cells results in impaired iodine transport with resultant low radioiodine and pertechnetate uptake. Thyroid scans generally show very patchy or no uptake generally, although in localized disease there can be visualization of the uninvolved area if the serum TSH is not too low. There can be a changing pattern on scan as the inflammation progresses from one lobe to the other and as recovery occurs in the two lobes at different time intervals (4,5).

Other etiologies for a painful thyroid include: abscess and bacterial infections, primary and metastatic neoplasm, amyloidosis, amiodorone associated thyrotoxicosis, pneumocystis carinii infection, hemorrhage, chronic thyroiditis, Graves' disease and infarction of a thyroid nodule (Table 1). Initially, acute suppurative thyroiditis may be difficult to distinguish from subacute thyroiditis as in Patient 2. Suppurative thyroiditis is exceedingly rare, but fine-needle biopsy aspiration would be instantly diagnostic. Painful chronic thyroiditis can have a transient hyperthyroid phase and may initially be indistinguishable from subacute thyroiditis (6). In painful chronic thyroiditis, the WBC and ESR are lower than in subacute thyroiditis, the antimicrosomal antibody titer is usually elevated, and eventual hypothyroidism is common. Painful Graves' disease has normal or elevated radioiodine uptake (7,8) and would not be confused with our three cases. The thyroid gland in thyroid amyloidosis is painful, the radioiodine uptake is low, the ESR high and the response to glucocorticoids dramatic, but there are features of systemic amyloidosis as well (9). In painful amiodorone associated hyperthyroidism, the radioiodine uptake is low (10), but this diagnosis is evident from the history. Pneumocystis carinii infection can be painful and have low tracer uptake in the involved areas (11), but the etiology should

**TABLE 1**  
Painful Nodule Evaluation

Etiology	Uptake and scan	History diagnostic	WBC and ESR	Antithyroid antibodies
Subacute thyroiditis	↓	No	↑	N
Infection	↓	No	↑	N
Lymphoma	Varies	No	Varies	Moderately ↑
Chronic thyroiditis	↓	No	N	↑
Graves' disease	↑	Often	N	Mildly ↑
Amyloidosis	↓	Yes	↑ ESR	N
Amiodarone-induced	↓	Yes	N	N
Pneumocystis carinii	Varies	Yes	↑	N
Malignancy	Varies	No	N	N
Hemorrhage	Varies	No	N	N

N = normal; ↑ = increased; ↓ = decreased.

be apparent from the history. Malignant neoplasms of the thyroid can be painful, presumably because of rapid growth as in Patient 3 (12,13). The low radioiodine uptake and thyroid scan appearance will depend upon the extent of neoplastic involvement in the gland. Similarly, hemorrhage into a thyroid nodule can have a variable scan appearance depending upon the extent of the bleeding (14). Again, fine-needle biopsy should be diagnostic for malignancy and hemorrhage.

Primary Hodgkin's disease of the thyroid is exceedingly rare with most cases involving the thyroid being secondary to mediastinal and/or cervical involvement (15-17). We feel this was most likely true for Patient 1. Most cases of lymphoma of the thyroid are non-Hodgkin's. Hamburger reported on 30 cases of thyroid lymphoma, of which four were painful. At presentation, 19 patients had discrete nodules and 11 had diffuse or multinodular goiter (18). Twenty-four had Hashimoto's thyroiditis, a common association.

Based on our experience with these three cases and this brief review of other causes for painful thyroid conditions, we recommend that if the initial presentation does not have the typical clinical findings, laboratory features including a high ESR, and poor tracer uptake on imaging characteristic of subacute thyroiditis, a fine-needle biopsy should be performed to establish the diagnosis. This is especially true if the process is localized to a nodule or one lobe. If corticosteroids are employed and the pain and swelling do not resolve within 72 hr, subacute thyroiditis is likely not the etiology. As our experience and this brief review of the literature shows, a favorable response to prednisone is not specific for subacute thyroiditis.

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